

Discipline:- Electrical Engineering	Semester:- 5th	Name of the teaching faculty:-
Subject:- Utilization Of Electrical Energy And Traction	No. of days/ per week class allotted:-4	Semester from:-
Week	Class day	Theory
1 <sup>st</sup>	1st	<b>1. ELECTROLYTIC PROCESS</b> 1.1 Definition and Basic principle of Electro Deposition.
	2 <sup>nd</sup>	1.2 Important terms regarding electrolysis
	3 <sup>rd</sup>	1.3 Faradays Laws of Electrolysis. 1.4 Definitions of current efficiency, Energy efficiency
	4 <sup>th</sup>	1.5 Principle of Electro Deposition.
2 <sup>nd</sup>	1st	1.6 Factors affecting the amount of Electro Deposition
	2 <sup>nd</sup>	1.7 Factors governing the electro deposition.
	3 <sup>rd</sup>	1.8 State simple example of extraction of metals.
	4 <sup>th</sup>	1.9 Application of Electrolysis.
3 <sup>rd</sup>	1st	<b>ELECTRICAL HEATING</b> 2.1. Advantages of electrical heating. 2.2. Explain mode of heat transfer and Stephen's Law.
	2 <sup>nd</sup>	2.3. Discuss principle of Resistance heating. 2.3.1 Direct Resistance heating. 2.3.2 Indirect Resistance heating.
	3 <sup>rd</sup>	2.4. Explain working principle of direct arc furnace and indirect arc furnace.
	4 <sup>th</sup>	2.5. Principle of Induction heating
4 <sup>th</sup>	1st	2.6. Working principle of direct core type, vertical core type and indirect core type Induction furnace.
	2 <sup>nd</sup>	2.7. Principle of coreless induction furnace and skin effect.
	3 <sup>rd</sup>	2.8. Principle of dielectric heating and its application
	4 <sup>th</sup>	2.9. Principle of Microwave heating and its application.
5 <sup>th</sup>	1st	<b>PRINCIPLES OF ARC WELDING</b> 3.1 Explain principle of arc welding.
	2 <sup>nd</sup>	3.2 Discuss D. C. & A. C. arc phenomena
	3 <sup>rd</sup>	3.3 D.C. & A. C. arc welding plants of single and multi-operation type.
	4 <sup>th</sup>	3.3 D.C. & A. C. arc welding plants of single and multi-operation type.
6 <sup>th</sup>	1st	3.4 Types of arc welding
	2 <sup>nd</sup>	3.4 Types of arc welding
	3 <sup>rd</sup>	3.5 Explain principles of resistance welding.
	4 <sup>th</sup>	3.6 Descriptive study of different resistance welding methods.
7 <sup>th</sup>	1st	<b>4. ILLUMINATION</b> 4 . 1 Nature of Radiation and its spectrum.

	2 <sup>nd</sup>	4 . 2 Terms used in Illuminations. i. Luminous intensity ii. Lumen iii. Intensity of illumination iv. MHCP v. MSCP vi. MHSCP vii. Brightness viii. Solid angle ix. Luminous efficiency
	3 <sup>rd</sup>	4 . 3 Explain the inverse square law and the cosine law
	4 <sup>th</sup>	4 . 4 Explain polar curves.
8 <sup>th</sup>	1st	4 . 5 Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors.
	2 <sup>nd</sup>	4 . 6 Design simple lighting schemes and depreciation factor.
	3 <sup>rd</sup>	4 . 7 Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps.
	4 <sup>th</sup>	4 . 7 Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps.
9 <sup>th</sup>	1st	4 . 8 Explain Discharge lamps.
	2 <sup>nd</sup>	4 . 8 Explain Discharge lamps.
	3 <sup>rd</sup>	4 . 9 State Basic idea about excitation in gas discharge lamps.
	4 <sup>th</sup>	4 . 10 State constructional factures and operation of: - Fluorescent lamp. (PL and PLL Lamps)
10 <sup>th</sup>	1st	<b>INDUSTRIAL DRIVES</b> 5 . 1 State group and individual drive.
	2 <sup>nd</sup>	5 . 1 State group and individual drive.
	3 <sup>rd</sup>	5 . 2 Method of choice of electric drives.
	4 <sup>th</sup>	5 . 2 Method of choice of electric drives.
11 <sup>th</sup>	1st	5 . 2 Method of choice of electric drives
	2 <sup>nd</sup>	5 . 3 Explain starting and running characteristics of DC and AC motor.
	3 <sup>rd</sup>	5 . 3 Explain starting and running characteristics of DC and AC motor.
	4 <sup>th</sup>	5 . 3 Explain starting and running characteristics of DC and AC motor.
12 <sup>th</sup>	1st	5 . 4 State Application of : 5.4.1 DC motor 5.4.2 3- phase induction motor series motor, universal motor and repulsion motor
	2 <sup>nd</sup>	5.4.3 State the application of 3-phase synchronous motors. 5.4.4 Application Of Single phase induction,
	3 <sup>rd</sup>	<b>ELECTRIC TRACTION</b> 6. 1. Explain system of traction.
	4 <sup>th</sup>	6. 1. Explain system of traction

13 <sup>th</sup>	1 <sup>st</sup>	6. 2. System of Track electrification
	2 <sup>nd</sup>	6. 2. System of Track electrification
	3 <sup>rd</sup>	6. 2. System of Track electrification
	4 <sup>th</sup>	6. 3. Running Characteristics of DC and AC traction motor
14 <sup>th</sup>	1 <sup>st</sup>	6. 3. Running Characteristics of DC and AC traction motor
	2 <sup>nd</sup>	6. 3. Running Characteristics of DC and AC traction motor
	3 <sup>rd</sup>	6. 4. Explain control of motor 6.4.1 Tapped field control
	4 <sup>th</sup>	6. 4. Explain control of 6.4.2 Rheostatic control 6.4.3 Series parallel control
15 <sup>th</sup>	1 <sup>st</sup>	6. 4. Explain control of 6.4.4 Metadyne control
	2 <sup>nd</sup>	6. 5. Explain Braking of the following types. 6.5.1 Regenerative Braking
	3 <sup>rd</sup>	6.5.2 Braking with 1-phase series motor
	4 <sup>th</sup>	6.5.3 Magnetic Braking <sup>6</sup>

Teaching Faculty

H.O.D.E.E

Academic Coordinator